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CLAIMS

1. A method of telecommunication over the Internet comprising the steps of:

inputting to a first communication terminal connected to a first telephone system a called directory number with a unique identifier;

responsive to said unique identifier translating the called directory number to an Internet address for an Internet to telephone system gateway capable of serving as a gateway between the Internet and a second telephone system serving said called directory number;

delivering to said second telephone system via said Internet said called directory number; and

establishing through said second telephone system a connection to a second communication terminal identified by said directory number.

2. A method according to claim 1 including the step of conducting two way communication between said communication terminals using telephone system protocol signals in said first and second telephone systems and TCP/IP in said Internet.

3. A method according to claim 1 including the steps of conducting two way communication between said communication terminals using connected circuits through

said first and second telephone systems and
connectionless virtual circuits through said Internet.

4. A method according to claim 3 wherein said communication is inputted and outputted at said first and second communication terminals as analog voice.

5. A method according to claim 1 including the steps of:

assembling a packet message addressed to said Internet to telephone system gateway capable of serving as a gateway between the Internet and said second telephone system serving said called directory number and including in said message said called directory number; and

establishing through said second telephone system said connection to said second communication terminal using said directory number delivered in said packet message.

6. A method of telecommunication over the Internet comprising the steps of:

inputting to a first communication terminal connected to a first telephone system a called directory number with a unique identifier;

responsive to said unique identifier translating the called directory number to an Internet address for an

Internet to telephone system gateway capable of serving
as a gateway between the Internet and a second telephone
system serving said called directory number;

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delivering to said second telephone system said
called directory number;

attempting to establish through said second
telephone system a connection to a second communication
terminal identified by said directory number;

15

upon failing to establish said connection to said
second communication terminal establishing a connection
to a storage associated with said second telephone
system;

20

storing a message for said second station in said
storage; and

delivering said message to said second station by
connecting said storage to said second communication
terminal through said second telephone system.

7. A method according to claim 6 wherein said
delivery of said message to said second communication
terminal is initiated from said second communication
terminal.

8. A method according to claim 6 wherein said
delivery of said message to said second communication
terminal is initiated from said second telephone system.

9. A method of telecommunication over the Internet comprising the steps of:

inputting to a telephone communication terminal connected to a first telephone system a called directory number and a domain or hostname Internet address;

translating the called domain or hostname address to an Internet address for a communication terminal designated by domain or hostname address;

assembling a packet message addressed to said Internet address and including in said message said called directory number;

delivering to said second telephone system said message in telephone system protocol; and

establishing through said second telephone system a connection to said second communication terminal.

10. A method of telecommunication over the Internet comprising the steps of:

inputting to a first communication terminal connected to a first telephone system having a common channel interoffice signaling (CCIS) network a called directory number with a unique identifier;

responsive to the unique identifier translating the called directory number to an Internet address for an Internet to telephone system gateway capable of serving as a gateway between the Internet and a second telephone system serving said called directory number;

delivering to said second telephone system via said Internet and said gateway said called directory number;

15 establishing through said second telephone system a connection between said gateway and a second communication terminal identified by said directory number;

20 signaling the establishment of said connection between said gateway and said second communication terminal to said CCIS network in said first telephone system;

25 establishing through said first telephone system a connection between said first communication terminal and a second gateway between the Internet and said first telephone system whereby a communication link is established from said first communication terminal to said second communication terminal through said first telephone system, said Internet, and said second telephone system.

11. A method according to claim 10 wherein said link comprises a connected link through said first and second telephone systems and a connectionless virtual link through said Internet.

12. A method according to claim 11 wherein said link transports two way digitized voice signals which

are inputted and outputted from said first and second communication terminals as analog sound.

13. A method of telecommunication over the Internet comprising the steps of:

inputting to a first communication terminal connected to a first telephone system having a common channel interoffice signaling (CCIS) network a called directory number with a unique identifier;

responsive to the unique identifier translating the called directory number to an Internet address for a first Internet to telephone system gateway capable of serving as a gateway between the Internet and a second telephone system serving said called directory number and having a common channel interoffice signaling (CCIS) network;

delivering to said CCIS network in said second telephone system said called directory number and determining if a second communication terminal identified by said directory number is available;

upon determining that said second communication terminal is not available, using said CCIS network in said second telephone system to deliver to said first gateway a signal indicating that said second communication terminal is not available;

responsive to said last named signal delivering through the Internet to a second gateway between said

25 Internet and said first telephone system a signal
indicating that said second communication terminal is not
available;

establishing a connection between said first
communication terminal and a first storage associated
30 with said first telephone system;

storing a message for said second communication
terminal in said first storage;

delivering said message from said first storage via
said Internet to a second storage associated with said
35 second telephone system; and

delivering said message from said second storage to
said second communication terminal by connecting said
second storage to said second communication terminal
through said second telephone system.

14. A method according to claim 13 wherein said
delivery of said message to said second communication
terminal is initiated from said second communication
terminal.

15. A method according to claim 13 wherein said
delivery of said message to said second communication
terminal is initiated from said second telephone system.

16. A method of telecommunication over the Internet
comprising the steps of:

inputting to a first communication terminal
connected to a first telephone system a called directory
5 number;

automatically translating the called directory
number to an Internet address for an Internet to
telephone system gateway capable of serving as a gateway
between the Internet and a second telephone system
10 serving said called directory number;

delivering to said second telephone system via said
Internet said called directory number;

automatically initiating a ringing signal to a
second communication terminal designated by said called
15 directory number; and

establishing a connection between said first and
second communication terminals via said Internet.

17. A method of telecommunication over the Internet
comprising the steps of:

inputting to a first communication terminal
connected to a first telephone system a called directory
5 number;

automatically translating the called directory
number to an Internet address for an Internet to
telephone system gateway capable of serving as a gateway
between the Internet and a second telephone system
10 serving said called directory number;

delivering to said second telephone system via said Internet said called directory number;

15 said second telephone system automatically initiating a connection to a second communication terminal designated by said called directory number; and

conducting voice communication between said first and second communication terminals via said telephone systems and said Internet.

18. A communication network comprising:

5 a first telephone system connected by central office switching systems to communication terminals identified by directory numbers for selectively establishing connections between said communication terminals;

10 a second telephone system connected by central office switching systems to communication terminals identified by directory numbers for selectively establishing connections between said communication terminals;

15 an internetwork separate from said telephone systems comprising multiple remotely spaced computer networks of varying types connecting computers of varying types, said computer networks being connected together by links including telecommunication links and using transmission control protocols for linking dissimilar computers through a TCP/IP protocol to provide addressing to provide connectionless packet service between said computers;

first and second gateways respectively connecting
20 said first and second telephone systems to said
internetwork at spaced locations;

said first and second gateways having addresses in
said TCP/IP protocol by which said gateways are
addressable;

25 at least one of said first and second gateways
having associated therewith a database of (a) directory
numbers for said communication terminals and (b) for each
directory number a TCP/IP address for a gateway which is
capable of connecting said communication terminal from
30 the telephone network to which it is connected to said
internetwork;

whereby an internetwork call may be initiated by
inputting to one of said communication terminals a
directory number for a called communication terminal to
35 which that directory number corresponds and obtaining
from said database the TCP/IP address of the gateway
which connects the telephone network to which said called
communication terminal is connected to said internetwork,
and connecting to said last named gateway via said
40 internetwork, and from said last named gateway connecting
to said called communication terminal through said
telephone network to which said called communication
terminal is connected to establish a communication link
from said communication terminal into which said called

45 directory number is inputted to the communication terminal designated by said directory number.

19. A communication network according to claim 18 wherein a voice communication is carried over said link.

20. A communication network according to claim 19 wherein each said gateway includes a router which translates digitized telephone network protocol voice signals to TCP/IP packets and vice versa.

21. A communication network comprising:

5 a first telephone system connected by central office switching systems to communication terminals identified by directory numbers for selectively establishing connections between said communication terminals;

10 a second telephone system connected by central office switching systems to communication terminals identified by directory numbers for selectively establishing connections between said communication terminals;

15 an internetwork separate from said telephone systems comprising multiple remotely spaced computer networks of varying types connecting computers of varying types, said computer networks being connected together by links including telecommunication links and using transmission control protocols for linking dissimilar

computers through a TCP/IP protocol to provide addressing for connectionless packet service between said computers;

20 first and second gateways respectively connecting said first and second telephone systems to said internetwork at spaced locations;

said first and second gateways having addresses in said TCP/IP protocol by which said gateways are addressable;

25 at least one of said first and second gateways having associated therewith a database of (a) directory numbers for said communication terminals and (b) for each directory number a TCP/IP address for a gateway which is capable of connecting said communication terminal from
30 the telephone network to which it is connected to said internetwork;

whereby an internetwork call may be initiated by inputting to one of said communication terminals a directory number for a called communication terminal to
35 which that directory number corresponds and obtaining from said database the TCP/IP address of the gateway which connects the telephone network to which said called communication terminal is connected to said internetwork, and transmitting said TCP/IP address and said called
40 directory number through said internetwork to establish connection to said last named gateway via said internet and deliver said called directory number to the telephone network connected to said last named gateway, and dialing

45 said directory number by said last named telephone
network to cause connection to said called communication
terminal through the telephone network to which said
called communication terminal is connected to establish
a communication link from said communication terminal
into which said called directory number is inputted to
50 said communication terminal which said directory number
designates.

22. A communication network according to claim 21
wherein a voice communication is carried over said link.

23. A communication network according to claim 22
wherein each said gateway includes a router which
translates digitized telephone network protocol voice
signals to TCP/IP packets and vice versa.

24. A communications network comprising:

5 a first telephone network having central office
switching systems connected to subscriber lines connected
to subscriber premise terminals for selectively providing
switched communications between said subscriber lines;

a second telephone network having central office
switching systems connected to subscriber lines connected
to subscriber premise terminals for selectively providing
switched communications between said subscriber lines;

10 first and second gateways to the Internet connecting
said first and second telephone networks to said
Internet;

at least one of said telephone networks including a
first centralized message information processing and
15 storage system capable of handling message information of
different types;

said telephone networks responding to a busy signal
as a result of an attempt to connect a calling subscriber
line to a called subscriber line through said Internet by
20 transmitting from the telephone network connected to said
called subscriber line to the calling telephone via said
Internet whereby a signal from a calling subscriber line
in said calling telephone network is stored in said
centralized message information processing and storage
25 system addressed to said busy subscriber line.

25. A communications network comprising:

a first telephone network having central office
switching systems connected to subscriber lines connected
to subscriber premise terminals for selectively providing
5 switched communications between subscriber lines;

a second telephone network having central office
switching systems connected to subscriber lines connected
to subscriber premise terminals for selectively providing
switched communications between subscriber lines;

10 first and second gateways to the Internet connecting
said first and second telephone networks to said
Internet;

15 said first telephone network including a first
centralized message information processing and storage
system capable of handling message information of
different types;

20 said second telephone network including a second
centralized message information processing and storage
system capable of handling message information of
different types;

25 said first telephone network responsive to request
received from a calling subscriber line connected to said
network storing in said first centralized message
information processing and storage system signals from
said calling subscriber line, transferring said stored
signals via said internetwork to said second centralized
message information processing and storage system and
storing said signals therein.

26. A communications network according to claim 24
wherein said stored signals are digitized voice signals.

27. A communications network according to claim 25
wherein said stored signals are inputted as analog voice
signals.

28. In a wide area communications network comprising:

5 a first telecommunication network having trunked central office switching systems connected to subscriber lines connected to subscriber premises terminals and including signal switching points and at least one signal transfer point for selectively providing switched communications between said subscriber lines;

10 a second telecommunication network having trunked central office switching systems connected to subscriber lines connected to subscriber premises terminals for selectively providing switched communications between said subscriber lines;

15 a controller associated with said first telecommunication network and arranged separately from said central office switching systems in said network and being connected to at least said signal switching points connected to said central office switching systems through at least one signal transfer point arranged to convey control data to effect communications, said
20 controller storing processing and routing data;

25 each said central office switching systems in said first telecommunication network providing selective communications between subscriber lines and a first centralized message processing and storage system for handling multiple different types of message information;

said first and second telecommunication networks being connected through first and second gateway routers to the Internet;

30 said first gateway router connected to said first telecommunication network having a signal transfer point associated therewith and connected to said controller;

 a method comprising:

35 ascertaining through said signal switching points and at least one signal transfer point in said first telecommunication network and through said gateway routers and said Internet the availability of a designated subscriber premises terminal in said second telecommunication network;

40 upon establishing the unavailability of said designated subscriber premises terminal through said Internet forwarding to said centralized message processing and storage system message information of a first type addressed to said designated subscriber premises terminal and storing said message information in
45 said centralized message processing and storage system;

50 subsequently establishing a link between said centralized message processing and storage system through said gateway routers and said Internet to said designated subscriber premises terminal; and

 forwarding to said designated subscriber premises terminal through said gateway routers and said Internet said message information.

29. A method according to Claim 28 wherein said forwarding of said message information to said centralized message processing and storage system includes establishing a connection to said centralized message processing and storage system from a subscriber premises terminal connected to said first telecommunication network, and transmitting said message information from said last named subscriber premises terminal and storing said message information in said centralized message processing and storage system.

30. A method according to claim 28 wherein said ascertaining step includes the steps of identifying said designated subscriber premises terminal by telephone directory number, translating said directory number to the Internet address of said second gateway router, transmitting to said second gateway router through said Internet said directory number, using said directory number in said second telecommunications network to establish the availability of said designated subscriber premises terminal identified by said directory number, and signaling through said second gateway router to said first gateway router a response to said availability inquiry.

31. A method according to Claim 29 including the step of communicating said response through said first

telecommunication network from said first gateway router
through at least one signal control point and one signal
5 transfer point.

32. A method according to Claim 31 wherein said
ascertaining is initiated in response to a signal from an
originating subscriber premises terminal connected to
said first telecommunication network and said response is
5 communicated to said originating subscriber premises
terminal.